

**California Department of Health Services
Division of Environmental and Occupational Disease Control
Occupational Health Branch**

HAZARD EVALUATION SYSTEM & INFORMATION SERVICE

Annual Report

December 2005 - November 2006

A report to the Legislature submitted to the Department of Industrial Relations for the
Hazard Evaluation System and Information Service

12/30/06

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This report is mandated in Labor Code Section 147.2. It details the implementation and operation of the repository, including but not limited to: the amounts of and source of funds allocated and spent on repository activities; the toxic materials, harmful physical agents, and other workplace hazards investigated during the past year, and recommendations made concerning them; actions taken to inform interested persons of possible hazards of exposure to toxic materials and harmful physical agents; and any recommendations for legislative changes relating to the functions of the repository.

The mandates of the Labor Code have been implemented in the following fashion:

1. Provision of a telephone information service to individuals seeking information about workplace hazards;
2. Provision of educational materials and an education/outreach function;
3. Provision of a hazard assessment function;
4. Provision of an extensive information repository; and
5. Provision of technical support and consultation regarding occupational health to the Department of Industrial Relations (DIR), California Department of Health Services (CDHS), and other agencies.

In 2006, HESIS continued to implement its mandates to protect California workers from occupational illness and disease. HESIS identified, evaluated, and provided practical information on toxic chemicals and other workplace hazards, assisted the DIR Division of Occupational Safety and Health (Cal/OSHA) in determining whether illnesses and diseases were work-related and in promulgating protective occupational health standards, and initiated and worked collaboratively with others on targeted public health projects and activities.

HESIS' accomplishments include:

- **Completing a United States (US) Environmental Protection Agency (EPA) Pollution Prevention grant project that evaluated use, toxicity, and safer alternatives for five new, unregulated industrial solvents** with the Institute for Research and Technical Assistance (IRTA) to protect workers and consumers, and to help businesses convert to the safer alternatives.

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- **Developing *N-Methylpyrrolidone (NMP) HESIS Health Hazard Advisory* to warn of the potential male and female reproductive toxicity and developmental toxicity** of this new, unregulated solvent, and to recommend safer alternatives that protect workers, consumers, and the environment.
- **Completing a contract project with the Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) that identified workplace chemicals posing excess risks of cancer and reproductive/developmental damage and protective exposure limits** to assist in recommending protective standards to Cal/OSHA.
- **Completing a contract project that developed a collaborative model to provide ongoing education and training on chemical hazards to immigrant workers** with the University of California Berkeley (UCB) Labor Occupational Health Program (LOHP).
- **Completing work on a South Coast Air Quality Management District (SCQAMD) Technical Review Committee for a study that identified and demonstrated safer alternatives to the current high-Volatile Organic Chemical (VOC) solvents used for cleaning printing press parts.** Other members of the technical panel included the Printing Industry Association; ink, roller, blanket, and press manufacturers; and local printers.
- **Developing and disseminating *Diacetyl (Butter Flavor Chemical) Use in Flavoring Manufacturing Companies HESIS Health Hazard Alert*** (English and Spanish) and other outreach materials to warn of California cases of bronchiolitis obliterans, a life-threatening lung disease, and to recommend ways to prevent new cases of the disease.
- **Implementing, with other CDHS Occupational Health Branch (OHB) and Cal/OSHA staff, *Flavor Industry Safety and Health Evaluation Program (FISHEP)*, a voluntary industrial hygiene and medical surveillance project** designed to identify at-risk exposures to diacetyl and other flavoring chemicals, identify workers who may be at risk for bronchiolitis obliterans, and develop industry-wide, prevention-based recommendations.
- **Providing technical assistance to Cal/OSHA in promulgating occupational health standards** through conducting a research study of heat-related illnesses and fatalities that established a basis for the new Cal/OSHA Heat Illness Standard, and participation on and provision of technical assistance for Advisory Committees charged with developing protective standards for diacetyl and an aerosol transmissible disease standard, and policies and procedures for amending Cal/OSHA Permissible Exposure Limits (PELs) for hazardous workplace chemicals and other agents.

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- **Providing medical consultations to assist Cal/OSHA** in determining whether cases of heat-related illnesses/fatalities, ergonomic injuries, and other illnesses were related to work, and recommending ways to prevent new cases.
- **Publishing and disseminating an updated version of the *HESIS Methylene Chloride Fact Sheet*** that includes information on health hazards; products; specific uses; safer alternatives that protect workers, consumers, and the environment; and requirements of the Cal/OSHA Methylene Chloride Standard.
- **Publishing, with other OHB staff, a final report, *Transforming Medical Waste Disposal Practices to Protect Public Health: Worker Health and Safety and the Implementation of Large-Scale Off-Site Steam Autoclaves*** that provides specific recommendations to help ensure that concern over a prior environmental hazard (e.g., dioxin exposure from medical waste incineration) does not result in new health risks to workers.
- **Publishing, with Cal/EPA and other CDHS staff, a final report, *Polybrominated Diphenyl Ethers: Recommendations to Reduce Exposure in California*** that addresses continuing exposures of Californians to these flame retardant chemicals after the manufacture, distribution, and processing of two specific types were prohibited in California on June 1, 2006.
- **Disseminating 14,176 HESIS publications and recording 261,644 Web site downloads and page views** of HESIS publications posted on the OHB Web site.
- **Providing reliable answers, daily, to questions about health effects, symptoms, and effects on pregnancy of chemicals and other workplace hazards** from employees, employers, health care providers, governmental agencies, unions, and other stakeholders.
- **Developing and presenting information on reproductive and developmental toxicants at Kaiser Permanente primary care conferences and through a videoconference to educate health care providers** and help them respond to patients' inquiries about the effects of workplace chemicals and other toxicants on pregnancy outcome.
- **Maintaining a Repository of Occupational Health Information (ROHI)** that consists of over 30,000 selected and uniquely indexed scientific articles, and continuing to work on a project to convert the articles from hard copy to electronic format and provide Web access to facilitate evaluation of worker hazards.
- **Continuing work on a project to promote the use of safer alternatives to toxic solvents** used in the lithographic printing industry through a contract with UCB School of Public Health.
- **Continuing work on a project to evaluate the feasibility of documenting occupational exposures on patient information forms** to characterize and

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identify at-risk exposures to reproductive and developmental toxicants for a cohort of pregnant patients through a contract with the UCB School of Public Health.

- **Initiating work on a project to pilot health and safety communication strategies to help protect farm workers from heat-related illness** through a contract with the UCB Labor Occupational Health Program.
- **Initiating work on a project to assess the capacity of local health care clinics to provide spirometry-based medical surveillance services to employers** through a contract with the University of California San Francisco.
- **Receiving a lifetime achievement award from the Western Regional Pollution Prevention Network** for the HESIS Chief's contributions to pollution prevention.

HESIS' work with collaborators to expand the public health impact of the program continued this year, and includes working with: (1) the Institute for Research and Technical Assistance (IRTA) and environmental protection agencies to promote the use of safer alternatives to toxic solvents and other chemicals; (2) Cal/OSHA, National Institute for Occupational Safety and Health (NIOSH), and others to protect against bronchiolitis obliterans in California's flavor manufacturing industry; (3) Cal/OSHA to develop a Heat Illness Standard to protect against heat-related illnesses and fatalities; (4) Cal/EPA OEHHA to identify workplace chemicals that pose excessive risks of cancer and reproductive and developmental damage and protective exposure limits; (5) Kaiser Permanente to build capacity among health care providers to prevent adverse pregnancy outcomes from workplace chemical exposures; and (6) UCB to determine how to inform and train immigrant workers about chemical hazards and how to promote the use of safer alternatives to toxic lithographic printing solvents.

HESIS continued to promote integrated prevention strategies that protect workers, communities, and the environment from toxic chemicals through: work with IRTA to identify and promote the use safer alternatives for five new, unregulated solvents, for toxic solvent-based lubricants and rust inhibitors, and for toxic paint stripping products; participation on a SCAQMD-sponsored study to identify safer lithographic printing clean-up solvents and to ensure that the alternative chemicals selected to comply with air quality regulations do not pose unintended, new health hazards for workers; representing California on the US Environmental Protection Agency's (EPA) Forum on State and Tribal Toxics Action (FOSTTA); developing and disseminating new HESIS publications on N-methylpyrrolidone and methylene chloride that include safer alternatives that protect workers, consumers, and the environment; participating in the IRTA Pollution Prevention Center Advisory Committee; and giving presentations on the topic at the Western Regional Pollution Prevention Network Annual Conference, Stanford University, and UCB.

HESIS continued to provide technical assistance to Cal/OSHA to help prevent workers from becoming ill and injured. HESIS provided medical consultation to Cal/OSHA

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Enforcement to determine whether 15 cases of illness, disease, or fatalities were work-related, and developed recommendations to assist employers in preventing new cases of work-related health problems. HESIS served on and provided technical assistance to Cal/OSHA Advisory Committees to help develop policies and procedures to amend permissible exposure limits for workplace chemicals and other agents, and to develop standards for diacetyl and aerosol transmissible diseases. HESIS continued to serve as a referral source for inquiries received by Cal/OSHA on the health hazards of chemicals and other workplace hazards, and to inform employers and workers about Cal/OSHA regulations and services through the HESIS workplace hazard helpline and HESIS publications. HESIS continued work on a project that will provide Cal/OSHA staff Web-based access to the HESIS Repository of Occupational Health Information, a collection of occupational health journal articles uniquely indexed for quick retrieval to assist staff with field investigations and other hazard assessment work.

Other collaborative public health activities this year included: publishing, with other OHB staff, a report on worker hazards associated with large-scale, off-site medical waste steam autoclaves and how to prevent them, and a scientific journal article on glutaraldehyde exposures among workers making bioprosthetic heart valves; working with the CDHS Indoor Air Working Group and the California Healthy Nails Collaborative, and initiating contract projects with the University of California to protect farm workers from heat illness, and to assess local health clinics' capacity to provide spirometry-based medical surveillance services to employers.

HESIS staff continued to assess the health hazards of specific work-related exposures and to provide technical assistance to agencies and groups. Surveillance of the occupational health literature, identification of new and unappreciated hazards, and expansion of the information repository are ongoing. The OHB Web site (www.dhs.ca.gov/ohb/HESIS/hesipub.htm) continues to showcase the publications developed by HESIS. HESIS also continued to provide support for OHB through active participation on the management team and serving on Branch-wide and Division-wide committees.

Section 1.01 Labor Code Section 147.2 - Mandate 1

Provide reliable information of practical use to employers, employees and representatives of employees, and other governmental agencies on the possible hazards to employees of exposure to toxic materials or harmful physical agents.

1. Telephone Response System (TRS)

- Consultations. Provided 189 formal health and safety consultations from December 2005 through November 2006. The consultations concerned *chemical* (54%), *biological* (12%), and *physical* (10%) agents, also *indoor air quality*, *primarily molds* (20%). *Other health and safety issues* (4%), including

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regulatory requirements and cancer and illness clusters, constituted the remaining consultations.

- Callers. Responded most frequently to inquiries from *employees* (45%) followed by *employers* (16%), *governmental agencies*, including Cal/OSHA (12%), *health care providers* (7%), *unions and non-governmental organizations* (7%), and *others*, including consultants and attorneys (13%).
- Inquiries. Received requests for *information* (56%) related to specific workplace hazards and issues, questions about the relationship of *symptoms* (24%) to work exposures, and questions related to the impact of work exposures on *pregnancy outcome* (20%).
- Mail-out Program (MOP). Continued to increase the efficiency of the TRS by developing, revising, and disseminating packets of materials on common toxic materials and other workplace hazards for which HESIS receives a large number of repeat inquiries. The MOP packets include generic letters, fact sheets, and other specific hazard evaluation/prevention information.
- Quick Response Program. Continued to identify and use comprehensive, existing responses to streamline the TRS process. The database serves as an informational resource for answering repeat questions on complex or unusual toxic materials or hazards.

2. Educational Materials Development

- *Diacetyl (Butter Flavor Chemical) Use in Flavoring Manufacturing Companies Health Hazard Alert (English and Spanish) (August 2006)*. Developed and published an alert to provide “early warning” and to recommend ways to prevent new cases of bronchiolitis obliterans, a life-threatening lung disease associated with exposure to diacetyl at California flavor manufacturing companies. Diacetyl also has been associated with bronchiolitis obliterans among workers in the microwave popcorn industry. Diacetyl causes similar respiratory damage in test animals, and is unregulated. The alert describes how workers are exposed to diacetyl, how it affects health, medical tests to determine health effects, ways to reduce exposure, and resources.
- *N-Methylpyrrolidone (NMP) Health Hazard Advisory (October 2006)*. Developed and published an advisory to inform workers and employers of the potential male and female reproductive toxicity, and developmental toxicity of NMP. NMP is unregulated, and is widely used as a substitute for methylene chloride and other chlorinated solvents that harm the environment. The advisory includes information on health effects, specific uses of NMP, products containing NMP,

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safer, pollution prevention substitutes, other industrial hygiene control measures, and resources.

- *Methylene Chloride Fact Sheet* (October 2006). Published a revised fact sheet that includes updated regulatory information, specific uses of methylene chloride, products that contain methylene chloride, and recommendations for safer substitutes and industrial hygiene control measures that reduce the risk of work-related cancer, nervous system effects, and heart disease, and environmental pollution.

3. Educational Materials Dissemination

- HESIS Outreach Activities / Publications Request Line. Distributed **14,176** HESIS publications through outreach activities and in response to direct requests during the report period. The Occupational Health Branch Web site generated some of the requests.

Mailed and electronically distributed *Diacetyl (Butter Flavor Chemical) Use in Flavoring Manufacturing Companies* (English and Spanish) to organizations and groups, including:

- ♦ California flavor manufacturing companies
- ♦ Labor and community-based organizations
- ♦ California Conference of Local Health Officers (CCLHO)
- ♦ California Conference of Directors of Environmental Health
- ♦ Western Occupational Medicine Association
- ♦ State Compensation Insurance Fund
- ♦ University of California Centers for Occupational and Environmental Health
- ♦ California Thoracic Society
- ♦ National Institute for Occupational Health and Safety (NIOSH)
- ♦ Council of State and Territorial Epidemiologists (CSTE) and
- ♦ Flavor and Extract Manufacturers Association of the United States.

Continued to mail HESIS publications to the Cal/OSHA District and Area Offices for further dissemination by Enforcement and Consultation staff, and to serve as resource information for their telephone consultations. Mailed the new edition of *Molds in Indoor Workplaces*, *Diacetyl (Butter Flavor Chemical) Use in Flavoring Manufacturing Companies* (English and Spanish), and HESIS publications with updated, CDHS Richmond campus addresses during the report period.

Organizations and groups that requested and disseminated HESIS publications include:

- ♦ California Department of Food and Agriculture distributed *Molds in Indoor Workplaces* at a stakeholders' meeting.
- ♦ Safety Management & Development used *Understanding Toxic Substances* in conducting Hazard Communication trainings.

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- ♦ Consumer Health and Information Services requested HESIS chemical and ergonomic fact sheets, health hazard alerts and advisories, booklets, and other publications to display in their Carson Regional Library.
 - ♦ Hy-Lite Products, Inc., used various HESIS chemical fact sheets and booklets as Hazard Communication training aids for their employees.
 - ♦ Cal/OSHA Consultation Service disseminated *Workplace Chemical Hazards to Reproduction* to assist employers.
 - ♦ Kaiser Permanente Women's Health Research Institute distributed *Workplace Chemical Hazards to Reproduction* at two Primary Care conferences to help OB-Gyn and occupational medicine health care providers respond to questions about the potential effects of chemical exposures on reproduction and development.
 - ♦ International Longshore and Warehouse Union (ILWU) distributed *Diesel Engine Exhaust Health Hazard Advisory* to their members who work at California ports.
 - ♦ Occupational Health Internship Program used *Sewing Machine Operators* (English and Spanish) as resource materials for student interns.
 - ♦ California Air Resources Board (CARB) Public Information Office continued to disseminate HESIS chemical fact sheets to educate the public about chemicals CARB has identified as Toxic Air Contaminants.
 - ♦ California Bureau of Barbering and Cosmetology continued to disseminate the HESIS booklet, *Artificial Fingernail Products: A Guide to Chemical Exposures in the Nail Salon* to educate licensees.
 - ♦ UC Irvine Environ. Health & Safety
 - ♦ First Response Ergonomics
 - ♦ CA Teachers Association
 - ♦ Applied Biosystems
 - ♦ Breathe CA of Sacramento Emigrant Trails
 - ♦ Cal/OSHA Medical Unit
 - ♦ Sacramento County Environ. Health
 - ♦ Cal/OSHA Enforcement
 - ♦ Continental Motor Works
 - ♦ International Rectifier
 - ♦ S.F. Department of Public Health
 - ♦ City of Los Angeles Housing Authority
 - ♦ Mono County Environmental Health
 - ♦ Inglewood Public Library
 - ♦ IHI Environmental
 - ♦ CDHS Environ. Health Investigations Branch
 - ♦ CA Laboratory Training Company
 - ♦ Salk Institute
 - ♦ County of Riverside Dept. of Public Health
- Conferences, Meetings, Presentations. Continued to distribute HESIS publications, brochures, and publication lists at formal conferences and meetings, and at presentations and lectures given by HESIS and other OHB staff. This year, these included the: ♦ Pacific Builders Safety Expo, Sacramento ♦ Western Regional Pollution Prevention Network Annual Meeting ♦ California Conference of Local Health Officers Meeting ♦ California Public Health Association—North Annual Meeting ♦ Cal/OSHA Advisory Committee Meetings ♦ California Healthy Nail Salon Collaborative ♦ Cal/OSHA Senior Industrial Hygienist Meetings ♦ Western Occupational Health Conference ♦ Workers'

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Compensation Conference ♦ Council of State and Territorial Epidemiologists Annual Meeting ♦ CDHS Indoor Air Quality Working Group

- TRS Consultations. Disseminated additional HESIS publications to supplement and reinforce the hazard evaluation and prevention information provided to callers.
- OHB Web Site. Continued to disseminate HESIS educational materials via www.dhs.ca.gov/ohb/HESIS/hesispub.htm

Posted *Diacetyl (Butter Flavor Chemical) Use in Flavor Manufacturing Companies Health Hazard Alert* (English and Spanish) to the OHB Web site during the report period.

Recorded **261,644** downloads and page views of HESIS publications from 12/1/05 to 11/30/06.

Top ten HESIS publications downloaded or viewed:

- ♦ *Chromium 6* (15,041) ♦ *Epoxy Resin Systems* (12,748) ♦ *Understanding Toxic Substances* (11,763) ♦ *Trichloroethylene* (9,737) ♦ *Rabies* (9,629)
- ♦ *Artificial Fingernail Products* (8,568) ♦ *What is Hepatitis C* (7,460)
- ♦ *Mercury* (7,303) ♦ *Glycol Ethers* (7,072) ♦ *Perchloroethylene* (6,987)

4. Education / Outreach

- Protecting Immigrant Workers from Occupational Illness and Disease: A Collaborative Model to Assess Needs and to Provide Education and Training. Completed work on this contract project that was implemented by the UCB Labor Occupational Health Program (LOHP). A goal of the project was to pilot a collaborative model between HESIS, LOHP, and community organizations to provide ongoing health and safety assistance to immigrant workers. The collaborative model will help HESIS understand the unique needs of immigrant workers and develop mechanisms to reach these workers with key information on new and emerging chemical hazards to protect against work-related illness and disease.

Based on a needs assessment with immigrant organizations that are members of the Working Immigrant Safety and Health (WISH) Coalition, LOHP developed a two-day Training of Trainers that focused on chemical hazards. The 21 attendees included representatives of organizations that work with Latino, Chinese, and Southeast Asian workers. The represented organizations provide outreach and training and services to workers in the following occupations/industries: homecare, domestic work (housecleaning and childcare), garment, restaurants, nail salons, agriculture, and day labor. HESIS participated

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in the training, which comprised an introduction to chemical hazards, including hazard identification, assessment, and control, and case examples of identifying and institutionalizing the use of safer substitutes. The training was conducted in English, with simultaneous translation into Spanish and Chinese. Training materials were available in the three languages. The final project report includes a summary of the needs assessment with WISH members, an evaluation of the chemical hazards training, and recommendations for HESIS that will help to ensure education and training for immigrant workers on occupational hazards, particularly chemical hazards.

- Protecting California's Farm Workers from Heat-Related Illness: Piloting Health and Safety Communication Strategies for Hard-to-Reach Workers
Initiated work on this new project through an interagency agreement with UCB LOHP. LOHP will develop and pilot various strategies to reach farm workers who are at risk for heat-related illness. Based on consultations with community-based groups, LOHP will conduct a needs assessment to identify effective ways of communicating prevention-based heat illness information to low wage, predominantly immigrant, farm worker communities. LOHP will select and pilot test one or two of the selected strategies, and will implement and evaluate a selected communication model (or models) with one or two community partners. The project will serve as a model to increase our understanding of how to reach other high-risk, hard-to-reach worker populations. It will help HESIS carry out its legislative mandates to provide practical information on workplace hazards to prevent occupational illness and injury. It also will increase the public health impact of the recommendations HESIS makes to prevent heat-related illness in providing ongoing consultations to the Cal/OSHA Medical Unit.
- Forum on State and Tribal Toxics Action Spring Meeting, Arlington, VA.
Presented *California Update: PBDE Ban Response and Green Chemistry—California Chemicals Policy Proposal*.
- Kaiser Permanente Spring Primary Care Conference, Maui, Hawaii. Presented *Reproductive and Developmental Toxicants* with Kaiser medical staff.
- Western Regional Pollution Prevention Network Annual Conference, San Diego, CA. Presented *Toxic Solvents in Auto Repair and Furniture Stripping: Protecting the Environment, Workers, & Communities*.
- Stanford University, Controversies in Women's Health Course. Presented *Healthy Childbearing: What We Know, Don't Know, & Should Know About the Effects of Toxic Chemicals*.
- Western Regional Epidemiology Network (WREN), Ashland, Oregon. Presented *Past Lessons, New Materials: Nanotechnology in the Workplace*.

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- American Public Health Association Annual Meeting Abstract. Co-authored, with other OHB staff, *Transforming Medical Waste Disposal Practices to Protect Public Health: Worker Health & Safety and the Implementation of Large Scale, Off-Site Steam Autoclaves.*
- Journal of Occupational and Environmental Hygiene Article. Co-authored, with other OHB staff, *Glutaraldehyde Exposures Among Workers Making Bioprosthetic Heart Valves* (in press).
- Kaiser Permanente Videoconference. Participated in *Women's Health: Preconception Health & Reproductive Toxicants* with the Director of Women's Health and a Women's Health Projects Investigator, Kaiser Permanente, Northern California.
- DHS OHB "Show & Tell" Meetings. Presented: (1) *Past Lessons, New Materials: Nanotechnology in the Workplace*; (2) *Identifying & Regulating Prop 65 Industrial Chemicals to Protect Workers*; (3) *Protecting Immigrant Workers From Toxic Chemicals: A Collaborative Model to Assess and Provide Education & Training*; and (4) *Reproductive and Developmental Toxicants: Working With Kaiser to Increase Health Care Provider Expertise and to Prevent Adverse Outcomes.* The purpose of the Show & Tell meetings is to ensure that staff are familiar with the work being conducted in OHB, and to increase opportunities for intra-branch collaboration—one of the goals of the OHB strategic plan.
- University of California, Berkeley Current Topics in Environmental Medicine Course. Presented *Toxic Chemicals: Protecting the Environment, Workers, & Communities.*
- Bay Area Ergonomics Study Group. Participated on a panel, *Global Perspectives on Ergonomics.* Presented examples of low-cost ergonomic solutions documented in various countries.
- Occupational Health Internship Program (OHIP). Presented *Workplace Health Hazards: What We Know, Don't Know, & Need to Know to Protect Workers* to help orient students participating in an 8-week program. The goal of the program is to link the skills and interests of students with the needs of workers to eliminate and control hazards and prevent occupational illnesses and injuries. A second goal is to interest students in pursuing careers in occupational health.
- Pacific Industrial and Business Association. Presented *Past Lessons, New Materials: Health & Safety in the Nanotech Workplace.*

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- Kaiser Permanente Fall Primary Care Conference, Las Vegas, Nevada. Presented *Reproductive and Developmental Toxicants* with Kaiser medical staff.
- Cal/OSHA Senior Industrial Hygienist and Medical Unit Meetings. Continued to provide reports of HESIS program activities and to solicit feedback on educational materials and key projects. Also discussed relevant OHB activities, and provided expertise during ongoing participation in these bimonthly meetings.
- CDHS Indoor Air Quality Working Group (IAQWG). Continued active participation in the Working Group. Continued to provide oral and written reports of HESIS activities, particularly related to indoor air quality, for dissemination within the group and posting on the IAQWG Web site.
- Pollution Prevention Center Advisory Committee Meeting. Continued to participate with other Committee members in discussions of completed and on-going projects conducted by the Institute for Research and Technical Assistance (IRTA) and applicable environmental and occupational health and safety regulations. Organized by IRTA, the Pollution Prevention Center is a unique partnership of businesses, agencies responsible for regulating air, water and waste streams, and public health agencies. Advisory Committee members include representatives of US EPA Region 9, Cal/EPA's Department of Toxic Substances Control and CARB, the City of Los Angeles Bureau of Sanitation, South Coast Air Quality Management District (SCAQMD), Southern California Edison, Rockwell International, and HESIS. The Center works with agencies and industries to provide the latest technological information on industrial cleaning processes as well as updates on environmental laws and regulations pertinent to all Advisory Committee members.

Labor Code Section 147.2 - Mandate 2

Collect and evaluate toxicologic and epidemiologic data and any other information that may be pertinent to establishing harmful effects on health of exposure to toxic materials or harmful physical agents.

1. Selected Hazard Assessments

- EPA Pollution Prevention Grant — Evaluation of Use, Toxicity, and Alternatives to New and Emerging Industrial Solvents

Completed work on this US EPA-funded project in collaboration with the Institute for Research and Technical Assistance (IRTA), a non-profit organization that provided contract services to HESIS. The goal was to identify specific uses of five new, unregulated solvents, educate workers and employers about the health hazards, and help businesses convert to safer alternatives to protect workers and community residents from chronic disease. As documented in the final report, *Assessment, Development, and Demonstration of Alternatives For Five Emerging Solvents*, IRTA visited facilities and determined how 1-bromopropane (1-BP), decamethylcyclopentasiloxane (D5), N-methylpyrrolidone (NMP), parachlorobenzotrifluoride (PBCTF), and 1,2-trans-dichloroethylene (DCE) are being used, identified consumer uses of the solvents, identified safer alternatives for the new solvents, and analyzed and compared cost, performance, cross media, and energy characteristics of the solvents and their alternatives. The IRTA report is available at www.irta.us/Five%20Emerging%20Chemicals.pdf.

Based on assessments of the health hazards of the five solvents, HESIS concluded the following:

1-BP health effects information including male and female reproductive toxicity, developmental toxicity, and neurotoxicity published in the 2003 HESIS Hazard Alert is still current. The National Toxicology Program (NTP) cancer bioassay data are pending. HESIS will update the Alert when the cancer data become available. The Permissible Exposure Limit for 1-BP of 1 to 3 ppm that HESIS recommended in 2004 is still under consideration by Cal/OSHA.

D5 caused hepatomegaly (increased liver weight), and cancer in female rats exposed by inhalation in a two-year study conducted by Dow Corning. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) is reviewing the cancer data in response to the Silicones Environmental Health and Safety Council's conclusion that the D5-induced cancer is due to a dopamine agonist effect that is not relevant to humans. The results of OEHHA's evaluation will determine whether a HESIS health hazard warning and recommendation for a protective PEL are warranted.

NMP harms the developing fetus when tested in pregnant animals and is toxic to the reproductive system of male and female test animals. It did not cause cancer in animal tests. HESIS developed an NMP Health Hazard Advisory that included recommendations for safer substitutes, a Skin Notation to warn of skin absorption, and maintenance of exposure levels below 5 ppm over an eight-hour work period. Since NMP was developed as an environmentally preferable substitute for methylene chloride, HESIS revised its existing fact sheet to include

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updated regulatory information and safer, pollution prevention substitutes for specific industrial uses of methylene chloride.

PBCTF toxicological data are limited. There are insufficient data to warrant development of HESIS educational materials and a recommendation for an occupational health standard. PBCTF was mildly toxic to rats and mice in 14-day oral administration studies conducted by the NTP. Based on the results, NTP concluded that PBCTF might be expected to induce renal tubular cell tumors in male rats in long-term studies due to an accumulation of $\alpha_2\mu$ -globulin in the kidney. Many studies have documented that this type of kidney cancer is specific to male rats and is not relevant to humans. The NTP Web site indicates that no reproductive, developmental, or immunology studies are available on PBCTF.

DCE is of concern toxicologically because of its structural similarity to vinyl chloride. The Cal/OSHA PEL of 200 ppm was set to prevent depressant effects on the central nervous system or brain. Based on a toxicological evaluation conducted by OEHHA in 2006, a Public Health Goal was set based on elevated levels of serum alkaline phosphatase, which can indicate liver damage. The No Observed Adverse Effect Level (NOAEL) for the study was 17 mg/kg-day. NTP conducted a 14-week study on DCE in 2002, and concluded that very little toxicity was associated with ingestion of microencapsulated DCE. A review of genetic testing reports shows no positive results in over 20 tests. Based on evaluation of the available data, HESIS did not develop an educational publication or recommend a revised PEL for DCE.

- South Coast Air Quality Management District (SCAQMD) Lithographic Printing Industry Study

Completed serving as a technical panelist for this study funded by SCAQMD. The purpose of the study was to determine whether there are viable alternatives to current high-VOC solvents used for cleaning printing press parts. Other members of the technical panel include the Printing Industry Association; ink, roller, blanket, and press manufacturers; and local printers affected by the District's rule 1171. The rule imposes future compliance dates for the use of lower-VOC cleaning materials. The Graphic Arts Technical Foundation worked on reformulating existing solvents, IRTA developed and demonstrated the effectiveness of new solvents, and the University of Tennessee evaluated the performance of low-VOC solvents. HESIS' participation on the panel helped to ensure that the alternative cleaning materials selected to comply with air quality regulations do not pose new hazards to workers.

Reviewed Material Safety Data Sheets (MSDSs) and evaluated the health effects of 14 high-VOC clean-up products used by printing facilities in the study, and 14 low-VOC alternative products identified by IRTA as being effective substitutes. Determined that, with one exception, all of the high-VOC products contain organic solvents. The solvent concentrations in 10 of the products ranged from 70 to 100 percent. The percentage of solvents in three products was

unspecified. Adverse health effects from overexposure to the solvent-based products are short- and long-term depressant effects on the central nervous system or brain, irritation of the eyes, nose, throat, and skin, and dermatitis. Glycol ethers in four of the products can affect the nervous system by absorption through intact skin in addition to inhalation. Ethylene glycol monobutyl ether (two products) and ethylene glycol monopropyl ether (one product) also can damage red blood cells and cause anemia. Trimethylbenzene (3 to 29 percent) in three products pose additional risks of asthmatic bronchitis and, due to benzene contamination, blood diseases and cancer. One product contains unspecified concentrations of d-limonene and ethylphenoxypolyethoxy ethanol. It poses potential hazards of skin irritation and allergic contact dermatitis (d-limonene) and endocrine disruption (ethylphenoxypolyethoxy ethanol).

Four of the 14 low-VOC alternative products have no hazardous ingredients listed on the MSDSs. Three products contain 70-100 percent fatty acid esters. One of the fatty acid-based products contains 1-3 percent ethylphenoxypolyethoxy ethanol (an endocrine disruptor), another contains 3-7 percent 1-hexadecene (associated with irritant and allergic skin reactions), and a third product contains 15-30 percent unspecified surfactants. Although a literature and chemical database search produced no toxicity data on fatty acid esters, they are not volatile, do not pose an inhalation hazard, and are of low toxicity compared to organic solvents. The European Union in conjunction with the US is sponsoring research on vegetable oils and their fatty acid esters as substitutes for organic solvents. One product contains 70-90 percent unspecified surfactants, and six products contain organic solvents (acetone, isopropyl alcohol, and dipropylene glycol monomethyl ether). The toxicity of the surfactants could not be assessed due to lack of information. Surfactants do not pose an inhalation hazard and are not neurotoxic, but some are endocrine disruptors. Overexposure to the solvent-based, low-VOC cleaners can cause the same health effects as discussed above for the high-VOC cleaners. However, the thresholds for producing these effects are higher for acetone and isopropyl alcohol. Dipropylene glycol monomethyl ether poses a hazard by skin absorption in addition to inhalation.

- Protecting Lithographic Printers from Chronic Health Damage:
Promoting the Use of Safer Alternatives for Toxic Clean-up Solvents
Continued to work on this project, that is being implemented through a contract with the UCB School of Public Health. The goal is to prevent potential long-term health damage among workers in the lithographic printing industry by promoting the use of safer alternatives to the toxic clean-up solvents currently in use. Identified lithographic printers potentially at risk for solvent-related health problems; conducted site visits at printing facilities to learn about the printing process, use of the solvents, work practices, and hazard controls; evaluated solvents used by the printers; published a fact sheet, *Protecting the Health of*

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Lithographic Printers—Safer Alternatives to Toxic Clean-up Solvents; conducted a workshop with printers to discuss health hazards of clean-up solvents, safer alternatives, and opportunities and barriers related to using safer solvent alternatives in specific lithographic printing facilities. Information from the project will help HESIS conduct outreach to the lithographic printing industry to help prevent work-related nerve damage, cancer, and other chronic health hazards. It will also help to protect the health of nearby communities and prevent environmental pollution caused by emissions of toxic printing clean-up solvents.

- Occupational Health Hazard Risk Assessment Project: Protecting California Workers from Chronic Health Damage

Completed work on this contract project with the Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA). Developed a draft project report that identifies selected industrial chemicals on the Proposition 65 List that may pose risks of cancer and reproductive/developmental damage because they are either not regulated by Cal/OSHA, or the existing Cal/OSHA Permissible Exposure Limit (PEL) is not based on cancer or reproductive/developmental damage. The report includes estimates of the excess cancer cases per 1000 workers exposed for a working lifetime at the Cal/OSHA PEL for selected Proposition 65 carcinogens. It also includes proposed PEL values for selected un-regulated and under-regulated chemicals that would lower the cancer risk for exposed workers to 1/1000. Based on the 1980 Supreme Court Benzene Decision, one excess cancer case per thousand workers is considered a “significant” risk for occupational carcinogens. A major goal of this project is to assist HESIS in implementing its legislative mandate to recommend science-based, protective occupational health standards to Cal/OSHA.

- Investigation of Bronchiolitis Obliterans Risk in the California Food Flavoring Industry

Developed Diacetyl Health Hazard Alerts (English and Spanish) and other outreach materials. Conducted extensive outreach, with other OHB staff, about work-related bronchiolitis obliterans in California flavoring manufacturing workers, and on how to identify and prevent new cases of this life-threatening disease. Implementing, with other OHB staff and Cal/OSHA staff, the *Food Flavor Industry Safety & Health Evaluation Program* (FISHEP). FISHEP is a voluntary, onsite industrial hygiene and medical surveillance project that is designed to: gather information on where and how diacetyl and other food flavoring chemicals are used in California flavor manufacturing companies; identify at-risk exposures; identify workers who may be at risk for bronchiolitis obliterans; and make industry-wide recommendations to protect the health and safety of workers potentially exposed to diacetyl and other food flavoring chemicals. Providing technical assistance and oversight regarding spirometry-based medical surveillance related to FISHEP.

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- Cal/EPA Polybrominated Diphenyl Ether (PBDE) Interagency Working Group
Completed participation, with other CDHS representatives and with representatives of Cal/EPA Boards, Departments, and Offices (BDOs) on this Workgroup formed at the direction of the Cal/EPA Secretary. Published a final Workgroup report, *Polybrominated Diphenyl Ethers: Recommendations to Reduce Exposure in California* (February 2006). The report addresses continuing exposures of Californians to PBDEs after prohibition of the manufacture, distribution, and processing of pentabrominated diphenyl ether (pentaBDE) and octabrominated diphenyl ether (octaBDE) flame retardants in California as of June 1, 2006. It provides information on PBDEs and a summary of past and ongoing Cal/EPA BDO and CDHS activities related to PBDEs. Based on a preliminary evaluation, the Cal/EPA PBDE Workgroup proposed specific steps to be taken by Cal/EPA BDOs and CDHS to reduce PBDE exposures through outreach and education, pollution prevention, measurement and monitoring of PBDEs, and regulatory initiatives. The Workgroup report is available at <http://www.oehha.ca.gov/pdf/pbdewrkgrprptfeb06.pdf>.
- Kaiser Healthy Childbearing Project
Continued work on this project that was initiated by Kaiser in response to inquiries from their patients about the effects of workplace chemicals on reproductive health and on pregnancy outcome. Developed a presentation, *Reproductive and Developmental Toxicants*, in collaboration with Kaiser medical staff. Using a case-based format, the purpose of the presentation is to help health care practitioners understand the types of questions patients ask about the effects of chemical exposures on reproduction and development, health endpoints that can be affected by exposure to reproductive and developmental toxicants, information needed to respond to patients' inquiries, and available resources, including the HESIS Workplace Hazard Helpline and HESIS publications. Gave the presentation with Kaiser staff at the Spring and Autumn Kaiser Primary Care Conferences. Participated in a Kaiser videoconference, *Women's Health: Preconception Health & Reproductive Toxicants*, moderated by the Director of Women's Health, Kaiser Permanente, Northern California. Educational objectives of the videoconference included helping clinicians: identify common reproductive and developmental toxicants, minimize the negative impact of unplanned pregnancies on the health of the mother and fetus, and refer patients with occupational exposures to HESIS.
- Evaluating Occupational Coding on Patient Information Forms to Identify At-Risk Exposures to Pregnant Workers
Continued work on this project that is being implemented through an interagency agreement with the University of California, Berkeley. Identified a health care facility to participate in the study. Determined, through a review of the literature, that self-administered questionnaires about occupational exposures can be used to identify relevant information for the study. Applying for Human Subjects

approval, and determining the type of subcontract or agreement needed to collaborate with the identified health care facility. The goal of the project is to evaluate the feasibility of characterizing occupational exposures for a cohort of pregnant patients and identifying toxicants that pose risks of developmental toxicity using occupational codes on patient information forms. This information would help HESIS conduct industry and job-related education and outreach to workers, employers, and health care providers on reproductive and developmental toxicants, and on ways to protect against exposure. The project was developed in response to the ongoing inquiries HESIS receives daily about effects of chemicals and other workplace exposures on pregnancy outcome.

- Large-Scale Steam Autoclave Treatment of Medical Waste: Investigation of Potential Worker Hazards Project

Published, with other OHB staff, a final report, *Transforming Medical Waste Disposal Practices to Protect Public Health: Worker Health and Safety and the Implementation of Large-Scale Off-Site Steam Autoclaves*. Project conclusions include: (1) workers had a high rate of injuries from ergonomic stressors, sharps, and safety hazards; (2) generators sent waste that was unsuitable for a steam autoclave to the facility; (3) generators' improper segregation of waste can lead to occupational and environmental exposures to hazardous chemicals and ionizing radiation; (4) the primary occupational hazards were related to the design of the work process, not to steam autoclave technology; (5) the employer had implemented many measures to prevent hazardous worker exposures; (6) exposure control measures disproportionately relied on controlling exposure after the hazard was created, rather than eliminating the hazard from the work process. Project recommendations include: (1) generate less waste; (2) incorporate prevention of work-related hazards into the design of all medical waste treatment technologies and associated work processes; and (3) adopt education, feedback, and incentive mechanisms to support primary prevention. The report is available at <http://www.dhs.ca.gov/ohb/OHSEP/medicalwaste.pdf>. The project was initiated in response to a technical assistance request from members of Health Care Without Harm who wanted to ensure that concern over a prior environmental hazard (e.g., dioxin exposure from medical waste incineration) did not result in new health risks to workers.

- Protecting California Workers From Respiratory Disease: Assessing the Capacity of Local Health Care Clinics to Provide Spirometry-Based Medical Surveillance Services to Employers

Initiated work on this new project implemented through an interagency agreement with the University of California San Francisco. The scope of work includes: identifying local industrial medicine clinics and other health care institutions currently providing spirometry services to employers in various regions of California, and determining the type and scope of the spirometry services being provided; providing an expert opinion regarding the capacity of

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local health care clinics to provide spirometry services to California employers to assist them in protecting their workers from respiratory disease; and providing recommended best practices for medical providers conducting workplace, spirometry-based medical surveillance. Information from the project will increase the effectiveness of HESIS mandates to recommend protective occupational health standards, and to provide practical information to employers to prevent occupational illness and disease.

- Ergonomic Hazard / Grocery Checkstand — Employee Assistance
Helped a grocery cashier who reported a musculoskeletal disorder associated with work for 25 years at a scanner check-stand of a major supermarket chain. The cashier had filed a workers' compensation claim and a Cal/OSHA complaint. According to the employee, other cashiers at the store also had ergonomic injuries. Explained the Cal/OSHA Ergonomic Standard and some of the challenges Cal/OSHA faces in enforcing it. Sent copies of the HESIS ergonomic fact sheet, *Grocery Cashiers—Serving Customers Shouldn't Hurt You* (<http://www.dhs.ca.gov/ohb/HESIS/cashiers.pdf>) to share with the employer and other cashiers. Sent publications and Web links pertaining to workers' compensation, job accommodation, and Cal/OSHA's policies and procedures regarding enforcement of the Ergonomics Standard.
- Embalming Chemicals / Hazard to Pregnancy — Employee Assistance
Evaluated potential risks to the pregnancy of a mortician who used several products. Review of the MSDSs indicated potential exposure to a variety of chemicals, including formaldehyde, glutaraldehyde, phenol, methanol, isopropyl alcohol, and acetone. Discussed the toxicity of the chemicals and explained that although some, like formaldehyde, glutaraldehyde, and phenol, pose serious health hazards, they were not selective developmental toxicants and did not pose risks of adverse pregnancy outcome, per se. In contrast, overexposure to solvents, including methanol, acetone, and isopropyl, are potentially toxic to the developing fetus since they are fat soluble, can cross the placenta, and can affect the developing central nervous system or brain. In addition, methanol may be selectively toxic to the developing fetus and can enter the body through inhalation and skin contact. Emphasized the need to keep exposures to a minimum through the use of local exhaust ventilation and skin protection, and to avoid overexposures, even for brief periods, that result in symptoms of central nervous system depression (dizziness, headache, nausea, etc.). Sent the HESIS solvents booklet (<http://www.dhs.ca.gov/ohb/HESIS/SolventSafety.pdf>), the HESIS fact sheet on formaldehyde (<http://www.dhs.ca.gov/ohb/HESIS/formaldehyde.pdf>), which includes specific ways to reduce exposures in the funeral industry, and the HESIS glutaraldehyde fact sheet (<http://www.dhs.ca.gov/ohb/HESIS/glutaral.htm>). Also sent information published by the California Department of Fair Employment and Housing on pregnancy benefits and rights.

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- Pigeon Droppings / Clean-Up Hazard — Employee Assistance
Assisted a custodian with a history of asthma who was concerned about symptoms of shortness of breath and coughing related to sweeping and shoveling large amounts of pigeon feces at a post office. He reported wearing gloves and a dust mask while sweeping, and having relief from symptoms when he was away from work. Discussed potential exacerbation of asthma due to dust exposure, and other potential pigeon-related diseases such as histoplasmosis and cryptococcosis. Advised discussing his occupational exposure and symptoms with his physician to determine if work restrictions are needed. Recommended wetting the dust prior to sweeping to control exposure, and wearing tyvek coveralls and an N-95 respirator, in addition to gloves.
- Dry Cleaning and Laundry Chemicals / Hazard to Pregnancy — Employee Assistance
Helped (with assistance from a bilingual OHB staff person) a worker who was monolingual in Spanish, five months pregnant, and experiencing work-related headache, nausea, and vomiting that she associated with various chemical odors in the dry cleaning facility. In addition to dry cleaning solvents, she reported use of ammonia and acids. Her job duties consisted primarily of handling client orders and bagging clothes. She did not mix chemicals or work in the laundry or dry cleaning sections of the shop, but reported a heightened sense of smell since becoming pregnant. Her physician wanted to remove her from work, but did not have information on her disability rights and eligibility for disability wages. Confirmed that odors can cause the worker's symptoms. Sent information (in Spanish) published by the California Department of Fair Employment and Housing on pregnancy disability rights, and information on workers' compensation.
- Mold / Office Carpet — Employee Assistance
Responded to an office manager's concern about chronic illnesses (diagnosed as sinus and ear infections) among office workers in a manufacturing facility following a sewage flood that contaminated the carpet. Although the carpet had been cleaned and dried, the odor remained, and the office manager experienced an exacerbation of symptoms after arriving at work each day. A request to the employer to replace the carpet reportedly resulted in a threat of being fired. Explained employees' right to a safe and healthful workplace, discussed medical referrals, and sent the HESIS fact sheet, *Molds in Indoor Workplaces* (<http://www.dhs.ca.gov/ohb/HESIS/molds.pdf>).
- Welding Hazards — Employee Assistance
Assisted a welder who said he represented 10-13 workers experiencing headaches, difficulty breathing, dizziness, and frequent colds/flu-like symptoms. Many of the workers were primarily Spanish-speaking and had worked at the

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food equipment factory between 5 and 13 years. They worked with stainless steel, mild steel, aluminum, and welding gases. He also reported significant exposure to dust from a glass bead sandblasting room and grinding machines. According to the welder, he and the other workers had received no training on workplace health hazards. They wore disposable dust masks to protect against exposure. Discussions with their employer about workplace health hazards reportedly resulted in termination of their employment. The workers had filed a Cal/OSHA complaint. Explained that it would probably take 4-6 weeks for the workplace assessment to be completed. Confirmed that the reported symptoms were consistent with work exposures, and referred the workers to a local health clinic for medical evaluations.

- Antineoplastic Agents / Hazard to Pregnancy — Employee Assistance
Assessed the potential effects of working with antineoplastic drugs on the outcome of the pregnancy of a hospital pharmacist. She worked in an oncology unit one day a week, but did not mix or prepare drugs. She counted out tablets (without gloves) and performed gas chromatography to verify the amount of the drugs. She wore gloves during the chromatography procedure. Although she was removed from these job duties when her pregnancy was confirmed, and has not worked with antineoplastic drugs since early in her pregnancy, she expressed concern about potential adverse effects during the time period before she knew she was pregnant. Based on information she provided about her job tasks and potential for exposure to the drugs, determined that she should not be at excess risk for an adverse outcome. Sent the National Institute for Occupational Safety and Health (NIOSH) publication on antineoplastic drugs and asked her to call back if she had additional questions or concerns after reviewing the information.
- Auto Repair Chemical Hazards — Employee Assistance
Assessed the relationship of work exposures and symptoms of dizziness, nausea, and headache experienced by a mechanic. The mechanic had spent three days cleaning up a recently flooded auto repair shop. He did not use protective equipment, and potentially was exposed to solvents, engine coolants, carburetor fluids, and other chemicals used in the shop. His symptoms were still present when he returned to the facility after clean-up. His physician recommended that he not return to work. Explained that his symptoms were consistent with exposure to solvents that he may have been exposed to during clean-up, and that may still be off-gassing in the shop. Sent the HESIS auto repair industry publications (<http://www.dhs.ca.gov/ohb/HESIS/aerosol.pdf>) and (www.dhs.ca.gov/ohb/HESIS/autorepair.pdf).
- Septic Tank Cleaning Hazards — Employee Assistance
Responded to a worker whose job is pumping septic tanks. He inquired about his employer's responsibility to provide personal protective equipment to prevent exposure to infectious agents in sewage. Explained that Cal/OSHA regulation

requires his employer to provide gloves and other personal protective equipment that are needed to protect him from exposure to sewage. The equipment must be capable of being cleaned and easily disinfected, and must be kept clean and in good repair. Protective equipment and clothing worn by employees must not be interchanged among employees until properly cleaned. In addition, explained that his employer must have a written Injury and Illness Prevention Program (IIPP). Major elements of the IIPP include: methods for identifying and quickly correcting workplace hazards; health and safety training; a health and safety communication system; and recordkeeping. Sent information on the infectious disease hazards of sewage.

- Epoxy Resins / Spa Manufacturing — Employer Assistance
Provided information to help an employer protect the health and safety of 16 employees who use epoxy resins in the manufacture of spas. The employer has a respiratory protection program and wanted to know if it should include baseline lung function testing of the employees. Based on information provided by the Cal/OSHA Consultation Service, explained that pulmonary function testing is not required by Cal/OSHA for work in this industry. However, to protect against work-related asthma and other pulmonary disease that can be caused by exposure to epoxy resins and other chemicals, HESIS recommends medical surveillance based on pulmonary function testing. This includes baseline pulmonary function tests at the time of first employment and periodically during employment. In addition, explained that a physician has to approve each employee for fitness to wear a respirator. For some employees, based on their medical history, the physician may require a medical exam. Sent copies of HESIS publications on epoxy resin systems (www.dhs.ca.gov/ohb/HESIS/epoxy.htm) and pulmonary function testing (www.dhs.ca.gov/ohb/HESIS/pft.htm).
- Lithographic Printing Chemicals / Safer Alternatives — Employer Assistance
Helped the owner of a print shop who was seeking advice regarding selection of a safe blanket/roller wash product. The shop is a county-registered "Green Business" and the owner is interested in environmental protection as well as workplace health and safety. Advised against using a naphthalene-containing product. Explained that naphthalene is carcinogen. Referred the owner to the Institute for Research and Technical Assistance (IRTA), a non-profit organization with which HESIS collaborates on developing safer substitutes for industrial solvents. In a recent project, IRTA identified safer alternatives for toxic solvents used in lithographic printing, and can provide guidance on alternatives that are effective for specific printing operations.
- Chloroform / Endodentistry Use — Employer Assistance
Researched information for a hospital industrial hygienist who inquired about the potential health risks associated with use of chloroform as a solvent to soften

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material used for root canals. According to the industrial hygienist, only a few drops of chloroform are used along with high suction. Obtained two scientific journal articles related to the subject that the industrial hygienist thought would be excellent resources: *Dental Workplace Exposure and Effects on Fertility* and *Chloroform in Endodontic Operations*.

- Fungal Infections / Employee Risks —Employer Assistance
Responded to a small business owner who was concerned about potential infectious disease risks to his employees and retail customers. He was concerned about the potential for visible, non-work-related fungal infections of the nails and eyes of one of his employees to spread to others. Explained that the owner could require a note from the infected employee's health care provider stating that it is safe for the employee to work. Health care providers normally account for the infectious nature of diseases, and would not approve return to work if it was not safe for others. Discussed the infected employee's right to privacy, and non-discrimination issues with the owner.
- Silica / Granite Fabrication Industry — Employer Assistance
Assisted an insurance broker who was unfamiliar with industrial hygiene. The broker inquired about monitoring silica dust in granite fabrication shops, and silica exposure control methods. Explained how airborne dust samples are collected and how they are sent for laboratory analysis to determine the type and quantity of silica dust. Described the recent Cal/OSHA findings of silica overexposure in granite fabrication shops where water was not used to control dust exposure. Referred him to industrial hygiene consultants on the CDHS Cal-Indoor Air Quality website and to the Cal/OSHA Consultation Service.
- Mold / Fitness Club — Employer Assistance
Provided information to a fitness club owner who wanted to know if HESIS could assess his facility for mold. He had already called many other government agencies. He also hired a private consultant to evaluate his facility after the landlord failed to abate the mold problems. He had moved all of the exercise equipment from the premises and was facing a costly proposal for professional decontamination of his equipment. Acknowledged that there is little government recourse for employers with leased facilities. However, questioned the need for costly decontamination of ordinary, non-porous surfaces, such as metal equipment upholstered in vinyl. Recommended simple cleaning of equipment. Sent the HESIS fact sheet, *Molds in Indoor Workplaces* and recommended industrial hygiene consultants on the CDHS Cal-Indoor Air Quality website.
- Warehouse Chemicals / Hazard to Pregnancy — Health Care Provider Assistance
Helped a family nurse practitioner assess the potential risks of a list of chemicals on the outcome of the pregnancy of her patient who worked in a warehouse. The

worker was 13-weeks pregnant. Explained that it is important in assessing pregnancy risks to determine which chemicals may selectively affect the developing fetus, and whether there is potential for exposure. The patient had not provided information on how the chemicals were used or other information regarding the potential for exposure. Based on a toxicity evaluation of the chemicals, informed the health care provider that several were selective developmental toxicants, including N-methylpyrrolidone, triethylene glycol, and polyethylene glycol. The list also included eight other solvents that were not selective developmental toxicants, but could adversely affect the developing fetus if the worker was overexposed to them, as indicated by symptoms of dizziness, headache, nausea, and other signs of central nervous system depression. The remaining chemicals on the list did not pose pregnancy outcome risks. Discussed the importance of determining if or how the chemicals are used, whether effective exposure control methods, including local exhaust ventilation and skin protection, are in place, and the employer's responsibility to provide a safe and healthful workplace, including protection against developmental toxicants, for the worker.

- Diacetyl / Food Flavoring Manufacturing Industry — Health Care Provider Assistance

Clarified the HESIS/OHB recommendation for medical surveillance of flavor manufacturing workers potentially exposed to diacetyl. The physician had received the HESIS Diacetyl Health Hazard Alert. Subsequently, he received a request from an employer in the industry to provide medical surveillance services. Reviewed the California cases of bronchiolitis obliterans associated with diacetyl exposure, the purpose of OHB's outreach, and specific components of the medical surveillance recommendation.

- Photographic Chemicals / Hazard to Pregnancy — Health Care Provider Assistance

Assessed potential pregnancy outcome and carcinogenic risks for a genetics counselor whose patient worked in photography and was concerned about a long list of chemicals contained in developers, stop baths, and other darkroom products. Based on evaluation of the list of chemicals, informed the counselor that none of the chemicals were known to cause cancer, and did not increase the patient's risk of an adverse pregnancy outcome. Sent the HESIS booklet, *Photography and Your Health: A Guide to Chemical Hazards in the Darkroom*.

- Paints / Concrete Manufacturing / Hazard to Pregnancy — Health Care Provider Assistance

Assessed potential risks to the pregnancy of a monolingual Spanish-speaking patient for an obstetrician. With the assistance of an OHB interpreter, learned that the pregnant worker was exposed to spray and brush paints while working in a concrete molding manufacturing facility. Review of the product MSDSs

indicated several potentially toxic chemicals. The worker reported symptoms that were consistent with overexposure to the chemicals. Worked with the obstetrician to facilitate the patient's return to work on modified duty.

2. Technical Assistance – Cal/OSHA Medical Unit Consultations

- Supercuts/ Madera — Ergonomic Injuries

Concluded that three reported injuries met the threshold for work-related, repetitive motion injuries in Cal/OSHA's Ergonomic Standard (Title 8 California Code of Regulations, Section 5110), including the following essential elements of the standard: (1) each employee was diagnosed with a repetitive-type injury; (2) each employee had an injury that was at least 50% caused by repetitive workplace activities (hair cutting and styling); (3) each employee's injury was diagnosed by at least one licensed physician; and (4) all three injuries were reported within a 12-month period. The conclusion was based on information provided by the Cal/OSHA industrial hygienist with the Medical Unit request, and a thorough review of the available medical records.

- Home Depot Store #625 / San Leandro — Fatality

Concluded that the death of an 82-year-old appliance salesman, who sustained an unwitnessed, but physician-confirmed fall at work, was due to subsequent brain effects caused by Coumadin-induced coagulopathy (inability to form blood clots). His scalp bruises (hematomas) rapidly resulted in evolving and expanding intracranial and subdural bleeds, and his anti-coagulated state prevented him from limiting this expansive process. The outcome (intracranial bleed in this case) documents a well-accepted risk to patients treated with anti-coagulant medications. Concluded, also, that it is still important to assess Home Depot's policies and procedures to determine if the injury and its consequences could have been prevented. The intracranial and subdural bleeds do not appear to have occurred spontaneously, so workplace hazard, injury, and illness prevention should also be assessed to identify any role it could have played in preventing this fatal outcome.

- Rainin Instruments / Oakland — Ergonomic Injuries

Concluded that 8 of the 13 reported repetitive motion injuries among Rainin employees met the threshold for work-related, repetitive motion injuries in Cal/OSHA's Ergonomic Standard, including the following essential elements of the standard: (1) each employee was diagnosed with a repetitive-type injury; (2) each employee had an injury that was at least 50% caused by repetitive workplace activities; and (3) each employee's injury was diagnosed by at least one licensed physician. Five of the injuries resulted from repetitive work due to computer use and related tasks. Four injuries occurred among packaging workers who were doing essentially identical tasks (verified in interviews with three of the four workers). The four packaging injuries occurred within a 12-

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month period and four of the five computer-related injuries also occurred within a 12-month period. These time frames are consistent with a fourth essential element of the Ergonomic Standard, and serves as another enforcement trigger.

However, a further assessment of Rainin's written program and on-site controls as required by the Ergonomic Standard provided adequate evidence that the company is in compliance with the program requirements of the Standard.

- Office Furniture World / Santa Rosa — Methylene Chloride-Related Illness
Recommended medical surveillance consistent with the Cal/OSHA Methylene Chloride (MC) Standard (Title 8, California Code of Regulations, Section 5202) for two employees exposed to MC during spray operations that were conducted in a small area without local exhaust ventilation. The purpose of medical surveillance and medical removal requirements of the Standard is to identify and prevent MC-induced health effects, including effects on the nervous system, heart, liver, and skin. The medical surveillance recommendation was based on the industrial hygiene report submitted with the Medical Unit request. The report included interview information from one of the employees (employed for approximately 3 years) who reported experiencing the following symptoms consistent with MC overexposure: cough with chest pain, sore throat, difficulty sleeping, eye swelling and burning, an irregular heart beat, and an episode of coughing up blood. At least one physician raised concern about his exposure to "hazardous chemicals" without ventilation. However, no medical attention was rendered to address this medical concern. Recommended priority treatment for the symptomatic employee with regard MC medical surveillance. Emphasized the importance of identifying a physician or other licensed health care provider competent and trained in the specialty of occupational and environmental medicine to manage the medical surveillance program, due to the serious and sometimes complicated medical decisions that often must be made under the MC Standard.
- KFM / Oakland — Manganese-Related Illnesses
Concluded that 12 workers (two current and 10 former workers) employed by KFM experienced symptoms consistent with overexposures to manganese that were documented by air sampling data. The results of neuropsychological tests conducted to provide supportive evidence were consistent, to some degree, with manganism, but were only suggestive and could not be considered conclusive. This was due to lack of baseline testing on the workers that is needed to document their neuropsychological function prior to their employment at KFM. However, although they are not conclusive for documenting work-related manganism, advised that the neuropsychological test results should be taken seriously from the standpoint of hazard assessment and injury and illness prevention. Recommended appropriate medical evaluations for any worker concerned that his signs and symptoms might be related to workplace

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exposures, to determine if workers' compensation claims should be filed. Future medical evaluations and repeat neuropsychological testing could document whether the initial findings improve with time and/or treatment.

- Berkeley Unified School District (BUSD) / Berkeley — Work-Related Symptoms
Concluded that it was plausible that identical symptoms experienced by three BUSD employees were work-related, based on the temporal relationship of the symptoms with workplace evidence of extensive water intrusion and abnormal odors. However, identification of a specific inciting workplace agent was not possible based on the available information. The medical records document the employees' clinic visits and concerns about symptoms related to workplace molds. Physicians' diagnoses reflected a possible association with environmental factors in the workplace, but were not definitive. If mold were present, it could have caused the reported symptoms. Recommended identification and correction of any underlying causes of water intrusion and cleanup of any visible mold contamination as described in the HESIS Fact Sheet, *Molds in Indoor Workplaces*. If this is done, workers should be able to safely re-enter the workplace and monitor for any new or recurrent symptoms.
- Pitney Bowes Government Solutions / Hayward — Ergonomic Injuries
Concluded that 9 of the 14 reported repetitive motion injuries among Pitney Bowes employees met the threshold for work-related, repetitive motion injuries in Cal/OSHA's Ergonomic Standard, including the following essential elements of the standard: (1) each employee was diagnosed with a repetitive-type injury; (2) each employee had an injury that was at least 50% caused by repetitive workplace activities; and (3) each employee's injury was diagnosed by at least one licensed physician; (4) two or more injuries occurred within a 12-month period; and (5) the workers performed identical work activities. All of the injuries resulted from essentially identical repetitive work activities due to material handling and related tasks. Some workers were specifically identified as performing either "box catching" or "box throwing". Written descriptions of the tasks associated with these job titles were reviewed to identify physically repetitive tasks. Evaluation of Pitney Bowles' written ergonomic program and on-site controls is needed to determine if the company has "established and implemented a program designed to minimize repetitive motion injuries" as required by the Ergonomic Standard.
- Diversified Utilities Services, Inc. / Bakersfield — Fatality
Concluded that the medical facts in the case do not conclusively point to a diagnosis of heat stroke. The deceased 58-year-old lineman undoubtedly experienced stress related to both heat and the workload associated with fighting the fire. However, the proximate cause of his death was his compromised cardiovascular system. An autopsy established that the immediate cause of death was an acute myocardial infarction (heart attack) due to longstanding

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atherosclerotic heart disease. This conclusion was supported by the evidence found on the autopsy examination of the heart and lungs. The toxicology results were negative and no other contributory factors were identified.

- Pacific Coast Steel, Inc. / Sonoma — Heat-Related Illness

Concluded, based on the available medical evidence, that this poorly acclimatized employee reported early symptoms of heat-related illness during a heat wave which included feeling weak and ill, vomiting, and ultimately collapsing and becoming unconscious at the worksite. Upon evaluation in the hospital emergency department, the employee displayed significantly altered consciousness, a highly elevated body temperature, rapid heart rate, dehydration, and muscle breakdown. The employee required invasive medical treatment, including intubation to facilitate breathing, central and peripheral intravenous lines for monitoring and fluid administration, and potent medications due to agitation. The employee responded well to treatment and was ultimately discharged in good condition two days post-admission. Since heat stress was identified as the major cause of this employee's hospitalization, recommended assessment of Pacific Coast Steel's health and safety program to determine if it is adequate under the Cal/OSHA Heat Illness Standard (Title 8, California Code of Regulations, Section 3395).

- MJ's Pizza, Inc. / Santa Rosa — Fatality

Concluded, based on the medical evidence, that a 67-year-old pizza delivery driver's arteriosclerosis, which over years caused extensive end-organ damage to his heart, kidneys, and blood vessels, caused his immediate death from an acute myocardial infarction. However, the employee was working under high heat stress conditions which, as documented in the coroner's report, contributed significantly to his death. The case illustrated the importance of having a Cal/OSHA Heat Illness Standard, and the critical need for employers and workers to recognize the association between personal risk factors and environmental heat exposure. The employee may have been experiencing symptoms consistent with heat stress (red, flushed, sweaty, and disoriented) but did not seem to associate his symptoms with heat, and therefore did not alert his coworkers or employer. The training requirements of the Heat Illness Standard are designed to address and heighten awareness of this association. To prevent future tragedies like this case, recommended evaluation of the employer's health and safety program to ensure its adequacy under the Cal/OSHA Heat Illness Standard.

- Heriberto Mosqueda Farm Labor Contractor / Galt — Fatality

Concluded, based on medical facts primarily from the coroner/autopsy report, that heat did not play a major role in this 59-year-old farm worker's death. The report supports the likelihood that the employee died from a severe underlying medical condition. It is quite plausible, given a recent heart attack, that his death

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was the result of his significant coronary artery disease. However, it is impossible to state that heat did not play a role in this employee's death. Working in an open field without shade in 90°F temperature would have put a burden on his compromised heart.

Evaluation of the employer's compliance with the Heat Illness Standard suggests that workers would be better protected from heat stress if a heat illness prevention program which addresses all elements of the standard were implemented. Specific attention should be directed toward training to heighten awareness of how underlying medical conditions can predispose susceptible individuals to heat stress, and of the signs and symptoms of heat-related illness, to ensure prompt medical attention. An effective training program can also help employees appreciate the rationale for adequate fluid intake and rest breaks so that they actually consume the fluid and take the indicated rest breaks.

- Diversified Utilities Services, Inc. / Bakersfield — Fatality

Concluded based on the available medical evidence that a 38-year-old electrical worker's death most likely resulted from underlying coronary artery disease. He was experiencing symptoms on the preceding days indicative of unstable angina (poor blood flow to the heart). Although the weather conditions were such that heat stress illness should be considered, there was nothing to suggest that he was experiencing symptoms consistent with heat-related illness. His ultimate illness course, including symptoms similar to his prior heart attack followed by cardiopulmonary arrest, are all consistent with his underlying condition.

Based on the evidence reviewed in this inspection, the employer appears to be in compliance with the Heat Illness Standard. Although it is not required, the employer might consider whether it is appropriate to have an Automatic External Defibrillator (AED) available in these rural/remote locations. This is the second Diversified Utilities Services employee in a year that has died of cardiac arrest in the field in spite of good emergency response procedures. In addition, heat stress prevention training should include a strong message that if an employee is experiencing the symptoms (due to an underlying medical problem) that this employee was experiencing days prior to his event, the employee should not be doing strenuous work, regardless of the weather conditions.

- D.C. Construction / Greenville — Heat-Related Illness

Concluded that a 53-year-old truck driver suffered from heat stroke to which underlying medical conditions contributed. The available medical evidence supports that he displayed generalized seizure activity following exposure to extreme heat after driving a truck without air conditioning on a hot day. It is likely that the temperature in the cab, without air conditioning, could have exceeded 110°F. All of the medical notes support that this employee's condition, including seizure activity, was related to heat exposure.

The employee clearly had underlying medical conditions that predisposed him to heat-related illness, including hypertension and alcohol abuse. His blood pressure was mildly elevated, and there was some indication that he was not compliant with his blood pressure medications. The medical records document the employee's alcohol use, but do not clearly attribute his seizure disorder to alcohol abuse. The admission note does state, however, that the seizure may have been multi-factorial. The employee's laboratory results show clear evidence of longstanding alcohol effects including the blood alcohol level, liver damage, and malnutrition. Although the laboratory results do not support significant dehydration, it is likely that his fluid status was insufficient to combat the effects of heat stress. Based on the fact that heat stress was identified as a major risk factor and cause of this employee's seizure, recommended that the employer's health and safety program be assessed to ensure that it is adequate under the Heat Illness Standard.

- City of Folsom Police Department / Folsom — Heat-Related Illness
Concluded, based on the medical evidence, that a 30-year-old SWAT member developed symptoms suggestive of early heat-related illness. This condition is sometimes referred to as heat syncope. Evidence suggests that he was volume depleted when he participated in a mock terrorist exercise, and had not consumed any food or beverages since 6 am that day. The exercise, which started at 12:30 pm, was performed in direct sunlight in a temperature of approximately 75°F with a relative humidity of 32% and a wind speed of 4 mph. The employee reported feeling dizzy at 1:20 pm, and fell down backwards. He subsequently was taken to the emergency room. The intake form indicates that he was dehydrated, nearly fainted, was nauseated, was sweating profusely, and had a rapid heart rate. He was discharged approximately one hour after receiving two liters of intravenous fluid hydration.
- Benton Custom Company / Cottonwood — Heat-Related Illness
Concluded, based on the medical evidence, that a 35-year-old laborer developed dehydration and heat exhaustion while working outdoors. He was hospitalized overnight and had evidence of muscle damage and mild liver and kidney damage. At the time of discharge he seemed to be improving, but subsequently, on the same day, manifested evidence of a heart attack. It is highly probable that his heart damage was secondary to the impact of dehydration, which resulted in a hemoconcentrated state (thickened blood). He had very few other cardiac risk factors that could have contributed to the heart attack. Despite what seemed to be a fair amount of fluid consumption on the day of the incident, it is probable that he became fluid depleted over several days since he had muscle cramping prior to the actual incident. Recommended assessment of the workplace to determine compliance with the Heat Illness Standard since heat stress was the predominant cause of injury.

3. Technical Assistance – Selected Other Constituents

- Disaster Response Drill — CDHS Emergency Preparedness Office
Served as Safety Officer for a drill of the Standardized Emergency Management System/Joint Emergency Operations Center, Pharmaceutical /Medical Supplies Branch. The State Receiving, Storage, and Staging Warehouse was the focus of the drill. This is an emergency warehouse and shipping/receiving operations for medical supplies which can be mobilized on short notice. Evaluated and controlled hazards that affected volunteers, paid workers, and visitors. Submitted a comprehensive, written report based on observations and experiences pertaining to the drill that was well received. The report included specific recommendations for increasing safety at the next mobilization.
- Shelter-In Place (SIP) Disaster Planning — CDHS / Division of Environmental and Occupational Disease Control
Representing OHB on a new, Division-wide committee that was convened to evaluate the adequacy of existing SIP plans for the CDHS Richmond Campus and to recommend any necessary improvements. Aspects of the SIP to be evaluated include the Contra Costa County warning system, emergency interruption of building ventilation system, employee communications, training, and post-incident facility clearance procedures. The CDHS Richmond Campus is located in an area that has a history of hazardous releases of bulk chemicals from industrial and transportation sites. Indoor sheltering-in-place planning will help to protect employees if future incidents should occur.
- Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe — California Department of Housing and Community Development
Provided information on current occupational exposure limits (Cal/OSHA Permissible Exposure Limits, American Conference of Governmental Industrial Hygienists Threshold Limit Values, and the National Institute for Occupational Safety and Health Recommended Exposure Levels) for solvents found in commercial pipe adhesive products. The information was used in the preparation of an Environmental Impact Report for the expanded use of CPVC for residential water distribution.
- tert-Butyl Acetate (TBAC) — Cal/EPA California Air Resources Board (CARB)
Provided information to assist CARB in determining whether to identify TBAC as a VOC-exempt solvent. The potential increased use of TBAC as an industrial solvent in inks and adhesives and in wood, metal, and automobile coatings, as a result of the exemption, would pose high cancer risks for workers. The Cal/OSHA Permissible Exposure Level for TBAC of 200 ppm is based on protecting workers from eye and respiratory irritation, not cancer. Based on a cancer unit risk value for TBAC published by Cal/EPA OEHHA, HESIS calculated that exposure over a

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working lifetime to TBAC at the Cal/OSHA PEL of 200 ppm would result in 74 excess cancer cases per 1,000 workers.

- Diesel Exhaust Particulate — Cal/EPA California Air Resources Board
Provided information to help ensure that staff assigned to clean diesel exhaust pollution test equipment are protected from exposure to accumulated soot and other particulates. Confirmed that diesel particulate contains carcinogenic chemicals as described in *Diesel Engine Exhaust HESIS Health Hazard Advisory* (www.dhs.ca.gov/ohb/HESIS/diesel.pdf). To control potential inhalation exposures, advised wetting dust that may be generated from the test equipment. Recommended protective clothing and equipment, and referred to other agencies for additional information and advice on hazardous waste disposal and potential safety hazards.
- Silica / Granite Counter Fabrication — State Compensation Insurance Fund
Provided information and resources to assist a safety representative in the preparation of a training program for their staff on the potential health hazards associated with this new industry and how to protect against them. Discussed the desired outcomes / goals of the training, as well as the type of background information on silica and granite counter fabrication the safety representative needed. Sent Web links to Cal/OSHA's Granite Counter Top Fabrication Hazard Alerts (English and Spanish) and the NIOSH Silica publications page, and the journal article, *Silica Exposure During Granite Countertop Fabrication* (Applied Occupational and Environmental Industrial Hygiene, 1999).
- Avian Flu / Employee Protection — California Department of Food and Agriculture (CDFA)
Helped an industrial hygienist evaluate potential health hazards and identify effective protective measures for CDFA employees who go into chicken houses/farms for avian flu eradication activities. Based on the high human fatality rate from avian flu, recommended a high level of employee protection. Advised ensuring that CDFA's Injury and Illness Prevention Program (required by Cal/OSHA) include the following elements: (1) training of inspectors about avian flu, including transmission and symptom recognition in poultry and humans, with updated information, as available; (2) practical criteria for designating suspected infection exposure situations for which personal protective equipment will be required; and (3) provision, required usage of, and training on personal protective equipment feasible for inspectors, including skin, eye, and respiratory protection. Sent *Interim Guidelines for the Protection of Persons Handling Wild Birds With Reference to Highly Pathogenic Avian Influenza* published by the US Geological Survey and Web links to relevant resource materials developed by other agencies, including the Occupational Safety and Health Administration (OSHA), Centers for Disease Control, World Health Organization, and Food and Agriculture Organization of the United Nations.

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- Cancer Cluster / Pesticides — Santa Barbara County Agricultural Commissioner's Office

Responded to a concern that five cases of cancer (prostate, breast, mouth/throat, esophageal, and pancreatic) among employees in the same office were work-related and represented a "cancer cluster". Explained the importance of recognizing that cancer is not one disease, but many diseases. Cancers of different organs, or in different tissues in the same organs, tend to have different causes. Thus, for example, if a cancer "cluster" consists of five different cancers, like the reported cases, it is not likely that the cases are related or caused by the same workplace exposures or substance(s). Also pointed out that there is no valid way to show whether there is any excess risk due to workplace exposures because of the small number of cases and diversity of the cancer types, and the long time period (12 to 25 years) required for cancer to develop compared to the tenure of the current employees. Recommended ways that the Commissioner's Office can help inspectors minimize exposures to pesticides, including having an effective Injury and Illness Prevention Program.

- Pandemic Flu Preparedness — Sonoma County Health Department

Assisted a County Health Officer in planning the purchase of respirators for "first responder" county workers. Provided an overview of some of the planning issues the County needs to consider. For example, explained that compliance with Cal/OSHA regulations require employers who choose to purchase and provide N-95 respirators to employees, to make clear whether the program is mandatory or voluntary. If mandatory, the employer must provide a thorough program which addresses fit of the respirator and training for each employee who uses a respirator. In part, this is to prevent employees from having a false sense of protection. Also explained that surgical masks are not "respirators" and no limitations disclaimer is required. Respirators are designed to keep outside contaminants from being inhaled by the wearer. Surgical masks are designed to keep the wearer from spreading their infectious agents in airborne droplets (speaking, coughing, and sneezing) to others. Sent Web links to the Cal/OSHA Respiratory Protection Standard and its appendices, and to other resource information.

- Contact Dermatitis / Auto Repair — City of Mammoth Human Resources Department

Assisted a personnel analyst in evaluating the potential cause and treatment of a mechanic's persistent and debilitating skin rash, and in determining how the City of Mammoth (City) could ensure his continued employment. The City had not been able to obtain a specific medical diagnosis, determine the causative agent(s), or control the mechanic's medical condition. Reviewed the medical records and the auto shop's collection of MSDSs, and had a teleconference with the employee, his supervisor, and the personnel analyst. Made a tentative

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diagnosis based on the available information, and identified a local health care provider for the mechanic. Made specific recommendations for protective clothing and work practices, and provided Web links to other resources and information.

- Pandemic Flu Planning / Employee Protection — Visalia School District
Provided information to assist a local school official with emergency planning. While purchasing N-95 respirators for facilities, transportation, and food service staff, the school district encountered a shortage of blue “medical” N-95 respirators, and wanted to know whether white “industrial” N-95s would be equivalent. Clarified that the colors were merely traditional for each setting and were not relevant, per se. However, in terms of emergency planning in general, recommended use of the CDC checklist for schools, and provided a Web link. Explained the function of respirators versus surgical masks and described the requirements of the Cal/OSHA Respiratory Protection Standard relevant to the provision of N-95 respirators to school employees. Advised that implementing a respiratory protection program as a part of pandemic flu emergency planning for the school district was not recommended, and that it would be expensive and time-consuming to set up and maintain the program.
- Furniture Stripper Products and Safer Alternatives / Toxicity Assessment — Institute For Research and Technical Assistance (IRTA)
Evaluated the toxicity of 10 products used to strip paint from furniture to assist IRTA (a non-governmental organization) in identifying safer, low-VOC alternatives that do not pose health hazards for workers or consumers. As a part of a pollution prevention project funded by the Cal/EPA Department of Toxic Substances Control, IRTA worked with furniture stripping businesses to identify and demonstrate the effectiveness of alternatives to solvent-based products currently in use that pollute the air and/or pose chronic health risks. Reviewed and evaluated product MSDSs and provided a written summary of the toxic effects of the product ingredients. Products used by the businesses in the project primarily contained high concentrations of the solvents, methylene chloride, a regulated carcinogen, and N-methylpyrrolidone, a male and female reproductive toxicant and a developmental toxicant. Benzyl alcohol-based furniture strippers were identified as effective and safer alternatives to strippers that contain these solvents. Animal cancer tests and reproductive and developmental toxicity tests of benzyl alcohol are negative. However, although it does not pose risks of cancer and reproductive/developmental harm, cases of allergic contact dermatitis from exposure to benzyl alcohol have been reported, and benzyl alcohol can be absorbed through intact skin in addition to being inhaled.

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- Molds / Construction Site — National Union of Elevator Constructors Local 18
Responded to a union representative seeking advice about the potential health risks to workers who were returning to a construction site that had been contaminated with mold. Two workers had been diagnosed with bronchitis that reportedly was associated with heavy mold exposure at the site. Advised that the site should be dried and cleaned of mold to the extent feasible. If mold is still present and they have to work at the site, respiratory protection (consistent with the Cal/OSHA Respiratory Protection Standard) may be required.
- Chlorine / Food Processing Industry — California Rural Legal Assistance
Provided toxicology and regulatory information to help this non-governmental organization evaluate potential health risks to a symptomatic produce packer. The worker reported symptoms that included headache and a burning sensation on the face that appeared to be associated with exposure to airborne chlorine compounds used in a disinfection bath for salad greens. The employer had recently changed the form of chlorine used as a disinfectant from hypochlorite (bleach) to chlorine dioxide (a gas), which resulted in a more noticeable odor. Explained that several chlorinated water byproducts, mainly chloramines, are not regulated by Cal/OSHA, but are strong irritants similar to chlorine and chlorine dioxide. The recent outbreaks of E. coli illnesses (affecting consumers of raw salad greens) may be causing changes in agricultural wash water disinfection systems that could have unintended, adverse health consequences for workers.
- Lubricant and Rust Inhibitor Products and Safer Alternatives — Institute for Research and Technical Assistance (IRTA)
Evaluated the toxicity of seven VOC-emitting lubricants, vanishing oils, and rust inhibitors and six alternative products in conjunction with an IRTA pollution prevention project. Helped to ensure that the alternative low-VOC products did not pose new, unintended health hazards for workers. The products currently in use contained high concentrations of organic solvents, which can cause short- and long-term effects on the central nervous system or brain. In comparison, the six alternative products were either non-toxic or of lower toxicity. Three of the alternative products contained no hazardous ingredients. One contained triethanolamine (10-20%), an occupational asthmagen, and another contained petroleum sulfonate (20-30%) for which no toxicity data were available. Petroleum oil, the major ingredient in a third alternative product, is a complex mixture of hydrocarbons of low volatility (and not easily inhaled) that can cause health effects analogous to those of organic solvents.
- Chemical Index / Lay Reader Information Guide — Hesperian Foundation
Provided chemical toxicity and safety information for a chart that will be appended to a book for factory workers. The Hesperian Foundation, a non-governmental organization, publishes health books for use internationally.

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The chart is designed by Hesperian for readers without previous health education, using pre-tested pictorial hazard symbols and lay language. Provided information on symptoms, cancer, and reproductive toxicity consistent with criteria established by the Foundation. Portions of the book will be available on the Foundation's Web site.

- Diacetyl / Potential Food Hazard — West County Toxics Coalition
Responded to the Executive Director who inquired about the potential health risks associated with food containing diacetyl. Explained that the HESIS Health Hazard Alert and the California cases of bronchiolitis obliterans were related to workers who inhaled diacetyl as opposed to eating foods containing the chemical. The Food and Drug Administration has identified diacetyl as GRAS (Generally Recognized As Safe).
- Nail Salon Health Hazards — California Healthy Nail Salon Collaborative
Providing technical assistance regarding ventilation and other exposure control methods to the Research Committee of this non-governmental organization. The primary mission of the Collaborative is to promote increased health and safety among nail salon workers and owners. Provided technical comments on the EPA booklet, *Pollution Prevention Practices for Nail Salons*, in response to requests by the Collaborative and an EPA representative. Sent links to NIOSH Health Hazard Evaluations conducted at nail salons and other relevant resource information. Members of the Collaborative include Asian Health Services, Northern California Cancer Center, and Alameda County Health Care Services Agency.

3. Information Repository

- HESIS Repository of Occupational Health Information (ROHI).
Continued to review key occupational health and toxicology journals; identify relevant articles; classify them by agent, health effect, or industry; and store them in ROHI binders. The database now consists of over 30,000 articles. ROHI facilitates quick identification and retrieval of information to support HESIS' hazard evaluation and technical assistance functions.

HESIS Electronic-Repository of Occupational Health Information (e-ROHI)

Continued work on this project to convert the hard copy ROHI to a Web-based format to provide desktop access to the uniquely indexed journal article collection and increase the efficiency of conducting hazard assessments.

Labor Code Section 147.2 - Mandate 3

Recommend to the Chief of the Division of Occupational Safety and Health (DOSH) that an occupational safety and health standard be developed whenever it has been determined that a substance in use or potentially in use in places of employment is potentially toxic at the concentrations or under the conditions used.

Standards Recommendations / Assistance

- Cal/OSHA Heat Illness Standard (California Code of Regulations, Title 8, Section 3395)

Provided technical assistance in developing the Cal/OSHA Heat Illness Standard that was adopted on June 15, 2006 by the Occupational Safety and Health Standards Board. Completed a research study, in collaboration with Cal/OSHA, that informed the rulemaking process. The study was suggested by the Cal/OSHA Heat Illness Advisory Committee, and focused on 25 cases of heat-related illnesses and fatalities that had been investigated by Cal/OSHA enforcement officers during the period May 2005 to November 2005. Data were obtained from interviews with enforcement officers involved in the cases, and review of the case files and associated medical unit records. Conclusions based on the research study included: (1) heat stress poses a significant hazard for workers in many industries in California; (2) Spanish-speaking male workers represented a large percentage of the 25 cases, and all age groups were impacted; (3) the seriousness of heat-related illness is reflected in the reported symptoms and signs and the evidence of organ damage; (4) 52% of the cases died and 36% were hospitalized; (5) workers' lack of acclimatization to heat was suggested by the short time period they were on the job prior to their heat stress incident; and (6) most employers had written Injury and Illness Prevention Programs, but few had evidence of a specific heat illness prevention program or specific training on acclimatization. Developed a written summary of the preliminary findings of the study (dated February 17, 2006) that was entered into the rulemaking record, and developed a power point presentation of the final study results for the Standards Board Hearing on April 20, 2006.

- Cal/OSHA Diacetyl Advisory Committee

Participated in an advisory committee meeting with stakeholders from government, industry, labor, and academia to discuss the development of a Cal/OSHA emergency standard for diacetyl. Cal/OSHA convened the advisory committee in response to a petition filed by the United Food and Commercial Workers Union that was prompted by cases of bronchiolitis obliterans among California food flavor manufacturing workers. Discussed the development and dissemination of the HESIS Diacetyl Health Hazard Alerts (English and Spanish)

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and other OHB outreach activities, and provision of technical assistance regarding medical surveillance and other prevention recommendations in the Alert. Participated in discussions of the proposed scope of a diacetyl standard, how or if a safe exposure limit could be determined, and medical surveillance of diacetyl-exposed workers in addition to a PEL to identify early symptoms and to prevent bronchiolitis obliterans. Distributed copies of the HESIS Diacetyl Alerts at the meeting.

- Cal/OSHA Advisory Meeting on Development of Permissible Exposure Limits (PELs) in California Code of Regulations Title 8 Section 5155
Participated in, and provided technical assistance for, three advisory meetings with stakeholders that included representatives from industry, governmental agencies, labor, and academia. The purpose of the advisory meetings was to discuss how revise the current process Cal/OSHA uses to update PELs. The advisory committee aims, specifically, to develop a policy and procedure for prioritizing substances for PEL amendment, and for conducting the PEL proposal process so that it promotes greater stakeholder participation and makes efficient use of limited Cal/OSHA staff resources. Provided comments and suggested revisions to draft policy and procedure documents that Cal/OSHA drafted based on input from the advisory group. The draft document addresses: criteria for developing a prioritized list of substances for review; the role and selection of the technical expert advisory committee; the role and selection of the feasibility and reasonableness advisory committee; and additional advisory committee process issues.
- Cal/OSHA Aerosol Transmissible Diseases Advisory Committee
Continued to participate in meetings and provide technical consultation and support to Cal/OSHA's Research and Standards Health Unit staff in developing a comprehensive standard to protect against TB and other aerosol transmissible diseases. Provided specific assistance and medical consultation regarding the development of a respiratory health questionnaire for workers wearing only N-95 respirators, and issues related to frequency of fit-testing. With stakeholders from industry, state and local governments, and organized labor, continued to provide input on elements of the proposed regulation, including the scope, a written aerosol transmissible disease exposure control plan, engineering and work practice controls, respiratory protection, and medical surveillance.
- Isocyanates / Cal/OSHA Experimental Variance (Title 8, California Code of Regulations, Section 5153(c) (1) — Fleetwood Enterprises, Inc.
Continued to provide technical assistance to Cal/OSHA regarding medical surveillance requirements (developed with assistance from HESIS) of the experimental variance granted to Fleetwood Enterprises in 2004. The experimental variance permits recirculation of air exhausted from spray operations that use isocyanate-containing paints. Reviewed questionnaires and

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spirometry data submitted to Fleetwood by the health care provider implementing the program. In response to a request from Cal/OSHA, provided a written evaluation of Fleetwood's medical surveillance program in May 2006. The evaluation included comments on Fleetwood's management of the program, ability of the program to protect employees from asthma, and the potential effects on employee health if Cal/OSHA issued a permanent variance. Provided expert testimony at a Cal/OSHA Standards Board hearing on Fleetwood's petition to Cal/OSHA for a permanent variance. The testimony included HESIS' work with SCAQMD to prevent unintended adverse health consequences to workers as a result of employers' compliance with air quality regulations, which reportedly had led to recirculation of isocyanate-contaminated air at Fleetwood.

- Cal/OSHA Bloodborne Pathogens Standard — Fresenius Medical Care North America

Provided technical assistance to Cal/OSHA in resolving a citation issued to Fresenius for not using an engineered sharps injury protection (ESIP) device for administering a drug (Epogen) into intravenous tubing connected to a dialysis machine. Fresenius had spent considerable resources developing the drug delivery system and thought that they had avoided the need to use an ESIP. In addition, use of an ESIP created an equipment "dead space" that resulted in costly loss of the drug. However, since the site of drug administration theoretically was still in contact with potentially contaminated blood, use of ESIP and compliance with the BBP Standard was required. Helped to facilitate settling of the case through review of proposed protocols and attending meetings with Cal/OSHA staff and Fresenius representatives.

Labor Code Section 147.2 - Mandate 4

Notify the Director of Food and Agriculture of any information developed by the Repository which is relevant to carrying out his or her responsibilities under Chapter 2 (commencing with Section 14001) of the Division of Food and Agriculture Code.

There were no activities under this mandate during the report period.

Labor Code Section 147.2 - Mandate 5

Assure the use of and non-duplication of resources of other governmental agencies.

Use of Other Governmental Agency Services / Resources

- Cal/OSHA. Continued, on a routine basis, to meet with, consult with, make referrals to, and use and disseminate Cal/OSHA educational materials and Web

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site information in providing TRS consultations and technical assistance, and in recommending occupational health and safety standards.

- CDHS. Continued, routinely, to consult with, make referrals to, and use materials and Web site information developed by numerous other CDHS programs to evaluate and provide consultations regarding workplace hazards. In the report period, these programs included: the Environmental Health Laboratory Branch Indoor Air Quality Section, Environmental Management Branch, Vector-Borne Diseases Section, Disease Investigations and Surveillance Branch, Radiological Health Branch, Environmental Health Investigations Branch, and the Immunization Branch.
- Cal/EPA - Office of Environmental Health Hazard Assessment. Continued to consult with OEHHA staff and use risk assessment resources to identify occupational carcinogens and reproductive toxicants and to assist Cal/OSHA in developing Permissible Exposure Limits for workplace chemicals. Continued to share the resources of the Occupational and Environmental Health Library.
- Cal/EPA – Department of Toxic Substances Control Pollution Prevention and Technology Development. Continued to consult with Cal/EPA staff and to use technical information and other resources to recommend pollution prevention strategies to protect workers from the adverse health effects of organic solvents and other hazardous substances.
- National Institute for Occupational Safety and Health (NIOSH). Continued to use and disseminate NIOSH educational materials and to use and refer callers to their Web site for information and publications. Continued to work with NIOSH staff to identify and protect workers that may be at risk for bronchiolitis obliterans in California's flavor manufacturing industry.

Section 1.02 Labor Code Section 147.2 - Mandate 6

Recommend legislative changes related to the functions of HESIS.

There were no activities conducted under this mandate in the report period.

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Authorized Positions in HESIS for 2006

Permanent positions

Research Scientist Supervisor II	Julia Quint, Ph.D.	100%
Public Health Medical Officer II	Janice Prudhomme, D.O., MPH	100%
Associate Industrial Hygienist	Elizabeth Katz, MPH, CIH	100%
Office Technician	Beverly Broadway	100%